

We claim:

1. An process for the preparation of pyridine and/or picolines which comprises contacting a mixture of carbonyl compound with ammonia in the presence of surface-passivated titanium-silicate catalyst in gas phase at a temperature ranging between 300 – 500°C, at gas space velocity in the range of 300 to 3000 h⁻¹ and at a pressure ranging between 1 to 10 atmosphere, condensing and separating the products by conventional methods. further purifying using well known conventional methods to obtain the products.
2. A process as claimed in Claim 1, where the carbonyl compound is an aldehyde represented selected from formaldehyde, acetaldehyde, propionaldehyde or a ketone such as acetone, propionone and the like.
3. A process as claimed in Claim 1 where the catalyst used has molecular formula $1 \text{ SiO}_2 : x \text{ TiO}_2$, where x is in the range of 0.005 and 0.05, having well crystalline characteristic structure characterized by powder X-ray diffraction pattern as described in Table 1.
4. A process as claimed in Claim 1 - 3, wherein the crystallite size of the catalyst used is in the range of 0.1 - 1.5 micron, preferably in the range of 0.3-0.8 micron.
5. A process as claimed in Claim 1-4, where the crystallites of titanium silicate catalysts are treated with silicon tetrachloride or silicon tetraalkoxide using chemical vapour deposition method.
6. A process as claimed in Claim 1 and 5, wherein the silicon tetraalkoxides is selected from silicon-tetra-methoxide, silicon-tetra-ethoxide silicon-tetra-isopropoxide silicon-tetra-butoxide and the like.
7. A process as claimed in any preceding claim, wherein the titanium-silicate catalyst is then loaded with other metal like lead, nickel, thallium or mixtures thereof.
8. A process as claimed in Claim 1-7, where the solid powder catalyst can optionally be mixed with inert binding substances like silica, alumina or mixture thereof and shaped into extrudates or pellets as desired, dried and calcined or spray dried to obtain desired particle size, preferably in the range of 50 – 100 microns.

9. A process as claimed in claim 1 to 8 wherein said passivated catalyst prepared and used in the process are catalyst A,B,C,D, & E.
10. A process as claimed in claim 1 wherein said catalyst B with crystallite size of 0.4-0.6 micron and C with crystallite size of 0.4 and 0.6 are significantly more productive compared to catalyst A, with crystallite size of 0.1-0.3, catalyst D with crystallite size of 1.0-1.5 as well as amorphous catalyst E.
11. A process as claimed in any preceding claim wherein said product is subjected to further conventional purification steps.

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